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AUTHOR Caldwell, Roger L.
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ABSTRACT

One of the working papers in the final report of the Arizona Board of Regents' Task Force on Excellence, Efficiency and Competitiveness, this document discusses the importance of foresight (a broad based, future-oriented evaluation) for Arizona's universities. Institutions of all types must recognize varying degrees of a need to base their decisions on adequate consideration of key external and internal trends as well as potential changes in these trends. Institutions must evaluate their own strengths and weaknesses in terms of present and anticipated operating environments. Foresight provides background for strategic planning activities by early recognition of changes. It also develops a framework within which to make today's decisions. It helps avoid future negative consequences and costs of ignoring external and internal factors during times of uncertainty. Foresight techniques include literature reviews, small group discussions, and roundtables or advisory committees. Implementation issues and possible pitfalls of this process are noted along with key ingredients for a successful program (e.g., understand today's realities first, involve the end user, and evaluate both data and ideas). The next decade in Arizona will bring much uncertainty in many areas involving the state and the university. Foresight capability should be developed in the universities and the Regents' staff in support of both strategic planning and current decision processes. Two appendices provide recent examples of foresight efforts by the U.S. Office of Technology Assessment and historic examples of results of not using foresight capability. Contains 13 references. (SM)

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FORESIGHT: DEFINITION AND NEED FOR ARIZONA UNIVERSITIES

ROGER L. CALDWELL

U.S. DEPARTMENT OF EDUCATION
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INTRODUCTION

Institutions of all types, including universities, recognize to varying degrees a need to base their decisions on adequate consideration of key external and internal trends, as well as potential changes in those trends. These institutions, if they are to continue to provide quality products, must evaluate their own strengths and weaknesses in terms of present and anticipated operating environments. This future-oriented understanding of today's events and developing patterns requires genuine commitment; an institution cannot afford to be merely reactive or shortsighted when dealing with potentially significant and long term impacts of everyday decisions.

Several terms have been used to describe the process of classifying change and its impact on an organization. The most widely used are "environmental scanning" and "issues management," but each of these carries specific connotations which are insufficient to portray the process intended here. For example, environmental scanning implies a review of trends and current data (historic events) with projections into the foreseeable future; issues management suggests the identification of emerging trends or issues. "Foresight" is becoming more conspicuous as a means of describing the relevant process. This term connotes a more broad-based, future-oriented evaluation, intended to serve as an early warning system, rather than a detailed collection of specific data. It includes an interdisciplinary approach and involves consideration of possible multiple causes and effects.

Foresight activities are now practiced by business and industry, government, nonprofit organizations and educational institutions[1]. These activities form a fundamental basis for strategic planning as well as more focused immediate decision making. Changes seem to be occurring more rapidly, hence the consequences of both informed and uninformed decisions are greater. The seemingly complex "modern times" may draw increased attention to the goal of recognizing future trends, but the need for foresight has always existed. Many examples demonstrate occasions when a practical type of foresight might have been advantageous.[2]

It should be noted that any institution performs some version of foresight. The process may be formal or informal, usually involves a number of individuals, and most likely has been more or less effective in the past. As we move to a time of greater uncertainties, more rapid

Roger L. Caldwell has been a member of the University of Arizona for 20 years, where he is a Professor of Soil and Water Science. He has served in several administrative positions relating to general environment, energy conservation, computing and information services, and academic planning. He has taught in the fields of plant diseases and pesticides, environment, alternative futures, and scientific communication methods. He has served on several state and local governmental committees relating to economic development, transportation and environmental concerns.

HE 022 483

rates of change, and an increased need for information sharing or participation, many thoughtful people recognize the need for a more formal process of foresightful planning.

This paper will describe briefly the purpose of foresight and its relevance to the Arizona universities and the Arizona Board of Regents, describe ways of performing the process, identify possible pitfalls, characterize key ingredients in a successful program, and list some examples of recent foresight assessments (Appendix A) and significant problems that could have been minimized by such an assessment (Appendix B).

The specific purposes for foresight are:

1. To provide background information for strategic planning activities by early recognition of changes (beneficial or adverse) in trends, cycles, or fads, and identification of emerging trends or major discontinuations of current trends or their interactions.

2. To develop a general framework within which to make today's decisions, based on societal directions and expectations in relation to university programs and activities. (Such a context is essential to understand the potential consequences of any single decision and the relationships of several decisions to each other.)

3. To avoid future negative consequences and costs of ignoring external and internal factors during times of uncertainty.

FORESIGHT TECHNIQUES

Before selecting specific techniques, for purposes of further discussion, we should state several assumptions about both the process and its relevance to Arizona universities. First, the "scanning" aspects of the process are more important than the collection of large amounts of extraneous information. Second, accumulating information across disciplines and evaluating the resulting interactions is more useful than learning a great deal about only a few areas. Third, the process should not be costly and should minimize duplication of other efforts. Finally, the process should be ongoing, since society and "current" issues are constantly in a state of flux.

The foresight toolbox contains a variety of techniques. Some selected tools might include the following:

1. LITERATURE REVIEWS. Selected literature sources can be monitored for both data and ideas; some may be summarized by other people but certain ones will require original reading. One component of reviewing published materials involves state and federal legislative bills and the results of their hearings.

2. SMALL GROUP DISCUSSIONS. Occasional meetings with small groups of people who represent diverse interests will allow follow-up discussion and provide unanticipated contributions.

3. ROUNDTABLES OR ADVISORY COMMITTEES. Continuing interaction with "blue ribbon" groups will provide continuity and increase network contacts of all group members for future sharing of relevant information.

4. ANONYMOUS INTERVIEWS OR SURVEYS. Non-structured interviews on general topics, conducted anonymously and individually with a cross selection of opinion leaders and

the general public will provide insight that may be more difficult to obtain from formal public statements. Surveys may provide either insight or indicate a lack of understanding by respondents in certain areas, which additional foresight tools could serve to clarify.

While the final product will likely take many forms, the educational aspects of the process itself may well be the most significant result. Specific products might include -- analytical position papers on selected issues, lists of emerging trends or uncertainties, or formal meetings (with appropriate discussion and publication of the proceedings).

IMPLEMENTATION ISSUES AND POSSIBLE PITFALLS

To be effective, any foresight process requires the involvement and support of those who will benefit from the results; therefore, the "need" for the process must be recognized and established by those who will be using it. Some foresight information can be collected by almost anyone (e.g., published listings of current trends), but other types of data should be collected by certain groups (e.g., probabilities of emerging trends, analyses of causative factors and possible consequences); the task of sorting out the appropriate responsibilities will not be easy. Care must be taken that the process is not "formalized" to such a point that it becomes meaningless; thus, the stress should be on "facilitating" the interactive thoughts of diverse groups rather than specifying an "office" to perform all functions internally.

Any new processes that are not clearly defined and do not have a generally perceived need will not be effectively implemented. The need for foresight capabilities is not immediately obvious, especially if operating on existing trends or annual incremental changes has been the habitual mode. The foresight capability takes on a new importance, however, when strategic visions are considered, when the operating climate is somewhat uncertain, and when change is likely to occur. On the other hand, the urgency for decisions involving near term actions may override the desire for longer term analysis and examinations of uncertainty; the speed offered by limited consultations with a few people conflicts with the need for repeated discussions with many people; and the relatively simple analysis of a few issues may be more appealing than the complex consideration of a number of issues and their interactions. These factors suggest that existing and comfortable processes will not be altered unless change offers clear advantages.

The challenge will be to perform appropriate but limited foresight activities and avoid the temptation to build large, unwieldy, duplicative databases or libraries of "possible trends" which consume excessive time and effort. Additional challenges are to impose constraining requirements of interdisciplinary or broad discussion on the process and to involve end users early enough so they will believe in the process and be willing to listen to the results.

KEY INGREDIENTS FOR A SUCCESSFUL PROGRAM

Formal foresight activities can take many forms; there is no one model that can apply to all situations or organizations. However, certain factors seem critical to any successful approach:

1. UNDERSTAND TODAY'S REALITIES FIRST. Any attempt to understand the range of possible future conditions must be based on a prior understanding of present realities. Part of this process should be directed at a careful understanding of the strengths and weaknesses of the institution. While this is not an easy task, the exercise and lessons learned will strengthen the foresight process when it is fully developed.

2. INVOLVE THE END USER. Those who will use the information developed in the process must be involved in the early stages. Given the diversity and management structure of a modern university, the number of people could (and should) be quite large. This involvement also increases the likelihood that the product will influence the decision making process.

3. DON'T COMPETE WITH THE DISCIPLINES. The reservoir of disciplinary expertise on the university campus should be linked by relevant questions, with any disparity between disciplinary perspectives noted. The foresight process should be structured to become institutionalized (and therefore integrated with other institutional units), rather than reflecting the focus of a particular individual.

4. EVALUATE BOTH DATA AND IDEAS. Quantitative data are easy to find and thus likely to be evaluated; but ideas, issues, and other qualitative information are also important. This information should be from multiple sources and disciplines, and the process should allow for integration of results and examination of conflicting findings. Both data and ideas should be discussed with non-university representatives for external validation. Care must be taken to include both the positive and negative aspects of an issue; it is not useful to be too pollyana-like or too doomsday-like.

5. DO NOT DEPEND ON A SINGLE SOURCE OF INFORMATION. Trying to understand future options and issues requires some redundancy of information gathering efforts. This might take the form of multiple sources of information or of cooperative collection efforts by several groups.

6. BEGIN SMALL AND THOUGHTFULLY. The complexity of working with a significant number of people and discussing subjects on which they might hold divergent views should not be underestimated. Principles for the initial stages should be to think small, to establish deadlines, to develop selection criteria for identifying issues, and to build credibility. This is an important time to build a volunteer network for future involvement of those in and out of the organization.

CONCLUSIONS

In recent years, Arizona has grown rapidly and the local and national economies have benefited from the growth in university research and instructional program diversity. The next decade, however, will bring more uncertainty in many areas involving both the state and the university[3]. A university cannot practically plan for the next decade or two without a strong sense of conditions external to the institution, and without identifying appropriate internal resource shifts needed to meet those conditions. In the process of making today's decisions and of developing a strategic plan, foresight activities are a

necessary ingredient of effective operations.

With the exception of short term economic forecasting, commonly used projection activities that might be considered equivalent to foresight are unstructured, fragmented and not widely shared with those having to make decisions. A foresight capability would provide support for analysis of alternatives, benefit from similar efforts in non-university environments (through appropriate links to representatives in those areas), and increase exposure of decision makers to broader ranges of possible actions and the probable consequences. It has direct and practical links to the planning and budgeting processes.

Arizona universities enjoy an impressive level of internal expertise, as well as significant links through various university faculty and administrators to non-university groups. With some organized efforts to link these information sources, the universities could develop a foresight capability that is more effective at less cost than other institutions. While it is not immediately clear how the workload should be distributed among the various universities and the Regents' staff or where the responsibilities would logically be located within an institution, a certain level of cooperative effort seems appropriate.

RECOMMENDATION

Foresight capability should be developed in the Arizona universities and the Regents' staff in support of both strategic planning and current decision processes. The role of the Regents' staff should be focused on the broad issues which are factual and useful to all the universities (e.g., demographic trends, national educational studies, and regional inquiries). The data and tentative conclusions should be shared fully by those participating in the process.

APPENDIX A:
Recent Examples of Foresight Efforts by US Office of Technology Assessment*

TECHNOLOGY AND STRUCTURAL UNEMPLOYMENT: REDEPLOYING DISPLACED ADULTS (February 1986, 448 pages, OTA-ITE-250).

Assesses the reasons and outlook for adult displacement, evaluates the performance of programs to serve displaced adults, and identifies options for improving service. The report also examines trends in international trade and their effects on worker displacement.

U.S. VULNERABILITY TO OIL IMPORT CURTAILMENT: THE OIL REPLACEMENT CAPABILITY (September 1984, 160 pages, OTA-E-243).

Provides an analysis of the technical potential for replacing large quantities of oil in the United States over a 5-year period by fuel substitution and conservation in the event of an extended oil supply shortfall and price rise; analyzes the macro-economic consequences of the shortfall and various rates of oil replacement by the technologies.

LIFE SUSTAINING TECHNOLOGIES FOR THE ELDERLY (in press, OTA-BA-306).

Reviews and evaluates the appropriate use of life-sustaining technologies, quality of life, patients' rights, surrogate decision making, and allocation of Federal health care resources.

INFORMATION TECHNOLOGY AND ITS IMPACT ON AMERICAN EDUCATION (November 1982, 280 pages, OTA-CIT-187).

Provides an overview of the issues relating to the educational applications of the new information technologies; examines both the demands that the information revolution will make on education and the opportunities afforded by the new information technologies to meet those demands.

TECHNOLOGY, INNOVATION, AND REGIONAL ECONOMIC DEVELOPMENT (July 1984, 168 pages, OTA-STI-238).

Identifies and describes the efforts of State and local governments, universities, and private sector groups to promote the creation, expansion, and retention of high-technology firms and industries.

TECHNOLOGY, PUBLIC POLICY, AND THE CHANGING STRUCTURE OF AMERICAN AGRICULTURE (March 1986, 380 pages, OTA-F-285).

Focuses on future and emerging technologies in other animal, plant, chemical, mechanization, and information areas and their implications for agricultural structure. Also explores linkages between policy and structure for a clearer understanding of the factors that influence the evolution of the agricultural sector.

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* U.S. Congress, Office of Technology Assessment. Established in 1972 (P.L. 92-484) to consider the complexity, breadth, and long-term implications of technology. Reports selected to provide examples of types of analyses.

APPENDIX B:

Historic Examples of Results of Not Using Foresight Capability*

THE CYCLAMATE AFFAIR (October 1969).

Diet sweetener was found to cause cancer in rats in long term feeding studies. The U.S. Food and Drug Administration announced all products containing cyclamates were to be off market by February 1, 1970. Public confusion developed because of conflicting decisions by official agencies and industry (as a result of legislative interpretation, limited data, closely held evaluations, and large scale use before adequate testing was completed). Data existed to enable an assessment 10 years in advance. Comment: the rapid commercialization of a new product exceeded the knowledge of side effects.

THE TORREY CANYON DISASTER (March 1967)

The first episode of a sea-going tanker running aground happened off the coast of Britain, spilling most of the 119,328 tons of cargo through a 650 foot long hole in the 974 foot ship. The sea currents carried the spill along the entire coast of Cornwall, causing damage to beaches and death to seabirds. Eventually the ship owners paid $7.2 million in damages. This tanker was flying the Liberian flag, was on charter from Union Oil of California to British Petroleum to haul oil from the Persian Gulf to Wales, was a well equipped vessel, and had an experienced Italian crew. The ship ran into a well-known navigational obstacle (reef) at top speed in a six mile wide channel. In addition, the weather was clear (8 mile visibility), and the ship was within range of three lighthouses, a

lightship, and a radio beacon. The problem was that it got off course and by the time the autopilot had been turned off it was too late to change course. Comment: the rapid increase in supertanker technology was not matched by understanding of the risks. The event led extensive studies in combating oil spills.

THE ASBESTOS HEALTH THREAT (Early 1960s).

Public discussion began related to the long known cancer of the lung in many heavily exposed asbestos workers. The health hazards were known and generally accepted as a risk to working with the materials. In 1971 the then new Environmental Protection Agency began regulatory actions. Differing opinions of experts, the various routes of exposure, and the long term incubation times make the direct links of these types of problems difficult to evaluate. Comment: the health impacts (to workers) were long known but the product was widely used and made a major impact on the economy. After publication of the Technology and Social Shock book, the following events occurred: bankruptcy for the major manufacturer, closure of an asbestos mine in Globe, AZ (where residences were placed on the tailings), and continued (today) concern/costs for removal of asbestos from public schools.

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Endnotes:

1. Several universities, perhaps two dozen, are using varying forms of environmental scanning.

2. Some examples include: animal rights concerns relating to university research animals, oil embargo and energy conservation actions, selected budget trends for specific sectors of society, environmental movement and resulting regulatory climate, and population shifts by age and location.

3. These uncertainties are addressed in a separate working paper, which includes a discussion of major driving forces, selected trends, and possible effects on universities.